



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q76266

Hiroyuki ASAOKO, et al.

Appln. No.: 10/608,625

Group Art Unit: 1645

Confirmation No.: 9860

Examiner: Unknown

Filed: June 30, 2003

For: MODIFIED REDUCTASE AND ITS GENE, AND USE THEREOF

**INFORMATION DISCLOSURE STATEMENT**  
**UNDER 37 C.F.R. §§ 1.97 and 1.98**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure under 37 C.F.R. § 1.56, Applicant hereby notifies the U.S. Patent and Trademark Office of the documents which are listed on the attached PTO/SB/08 A & B (modified) form and/or listed herein and which the Examiner may deem material to patentability of the claims of the above-identified application.

1. JP-A 10-94399, published April 14, 1998, to SHINYA et al., with English Abstract.
2. ITOH et al., "Production of chiral alcohols by enantioselective reduction with NADH-dependent phenylacetaldehyde reductase from *Corynebacterium* stain, ST-10", *Journal of Molecular Catalysis B: Enzymatic*, Vol. 6, 1999, pp. 41-50.
3. ITOH et al., "Purification and Characterization of Phenylacetaldehyde Reductase from a Styrene-Assimilating *Corynebacterium* Strain, ST-10", *Applied and Environmental Microbiology*, Vol. 63, No. 10, October, 1997, pp. 3783-3788.
4. WANG et al., "Cloning, sequence analysis, and expression in *Escherichia coli* of the gene encoding phenylacetaldehyde reductase from styrene-assimilating *Corynebacterium* sp. Strain ST-10", *Applied Microbiology Biotechnology*, Vol. 52, 1999, pp. 386-392.

ASAKO et al.  
Appln. No. 10/608,625  
Information Disclosure Statement

5. JP-B2 2566962, issued October 3, 1996, to Denki Kagaku Kogyo KK, with English Abstract.
6. JP-A 1-222787, published September 6, 1989, to Nippon Synthetic Chem. Ind., Co., with English Abstract.
7. JP-A 60-251890, published December 12, 1985, to Nippon Synthetic Chem. Ind. Co., with English Abstract.
8. JP-A 63-123387, published May 27, 1988, to Denki Kagaku Kogyo KK, with English Abstract.
9. U.S. Patent No. 4,895,979, issued January 23, 1990, to Noyori et al.
10. U.S. Patent No. 6,218,156 B1, issued April 17, 2001, to Yasohara et al.
11. U.S. Patent No. 6,312,933 B1, issued November 6, 2001, to Kimoto et al.
12. U.S. Patent No. 5,908,953, issued June 1, 1999, to Matsuda et al.
13. ITOH et al., "1465. Chiral alcohols production by enantioselective reduction with NADH-dependent phenylacetaldehyde reductase (PAR)", *Book of Abstracts, 2000 International Chemical Congress of Pacific Basin Societies*, December 14-19, 2000, p. 9.
14. ITOH et al., "3Y7p7. Production of optically active alcohol by using a phenylacetaldehyde reductase (PAR) recombinant strain", *Nippon Nogeikagaku Kaishi*, Vol. 75, March 5, 2001, with translation of 3Y7P7.
15. ITOH et al., "3F302β. Analysis of the phenylacetaldehyde reductase (PAR) gene from styrene-assimilating *Corynebacterium*", *Nippon Nogeikagaku Kaishi*, Vol. 74, March 5, 2000, with translation of 3F302β.
16. ITOH et al., "3F303α. Production of optically active alcohol by using the phenylacetaldehyde reductase (PAR) from *Corynebacterium* sp. ST10", *Nippon Nogeikagaku Kaishi*, Vol. 74, March 5, 2000, with translation of 3F303α.
17. U.S. Patent Application Publication No. 2003/0134402 A1, published July 17, 2003, to Asako et al.
18. ASAKO et al., "P214. Chiral Alcohol Production by β-Ketoester Reductase from *Penicillium citrinum* Coupled with Regeneration System of NADPH", *Chem. Litsy 97, 6<sup>th</sup> International Symposium on Biocatalysis and Biotransformations*, June 28-July 3, 2003, p. 489.
19. Lecture Summary Series of the 6<sup>th</sup> Organism Catalyst Chemistry Symposium, December 12-13, 2002, p. 70, with partial English translation.
20. Conference Lecture Summary Series, published March 5, 2003, 3A11a01, with partial English translation.

ASAKO et al.  
Appln. No. 10/608,625  
Information Disclosure Statement

21. JP-A 2001-294549, published October 23, 2001, to Pfizer Prod. Inc., with English Abstract.

One copy of each of the listed documents is submitted herewith.

The present Information Disclosure Statement is being filed: (1) No later than three months from the application's filing date; (2) Before the mailing date of the first Office Action on the merits (whichever is later); or (3) Before the mailing date of the first Office Action after filing a request for continued examination (RCE) under §1.114, and therefore, no Statement under 37 C.F.R. § 1.97(e) or fee under 37 C.F.R. § 1.17(p) is required.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicant does not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,

  
John T. Callahan  
Registration No. 32,607

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: January 5, 2004

Substitute for Form 1449 A &amp; B/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet

1

of

2

| Complete if Known      |                 |
|------------------------|-----------------|
| Application Number     | 10/608,625      |
| Confirmation Number    | 9860            |
| Filing Date            | June 30, 2003   |
| First Named Inventor   | Hiroyuki ASAOKO |
| Art Unit               | 1645            |
| Examiner Name          | Unknown         |
| Attorney Docket Number | Q76266          |

| U.S. PATENT DOCUMENTS |                       |                 |                                      |                                |                                                 |
|-----------------------|-----------------------|-----------------|--------------------------------------|--------------------------------|-------------------------------------------------|
| Examiner Initials*    | Cite No. <sup>1</sup> | Document Number |                                      | Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
|                       |                       | Number          | Kind Code <sup>2</sup><br>(if known) |                                |                                                 |
|                       |                       | US 4,895,979    | A                                    | 01-23-1990                     | Noyori et al.                                   |
|                       |                       | US 6,218,156    | B1                                   | 04-17-2001                     | Yasohara et al.                                 |
|                       |                       | US 6,312,933    | B1                                   | 11-06-2001                     | Kimoto et al.                                   |
|                       |                       | US 5,908,953    | A                                    | 06-01-1999                     | Matsuda et al.                                  |
|                       |                       | US 2003/0134402 | A1                                   | 07-17-2003                     | Asako et al.                                    |
|                       |                       | US              |                                      |                                |                                                 |

| FOREIGN PATENT DOCUMENTS |                       |                           |                     |                                |                                                    |                                 |          |
|--------------------------|-----------------------|---------------------------|---------------------|--------------------------------|----------------------------------------------------|---------------------------------|----------|
| Examiner Initials*       | Cite No. <sup>1</sup> | Foreign Patent Document   |                     | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Translation <sup>6</sup>        |          |
|                          |                       | Country Code <sup>3</sup> | Number <sup>4</sup> |                                |                                                    |                                 |          |
|                          |                       | JP                        | 10-94399            | A                              | 04-14-1998                                         | SHINYA et al.                   | Partial  |
|                          |                       | JP                        | 2566962             | B2                             | 10-03-1996                                         | Denki Kagaku Kogyo KK           | Abstract |
|                          |                       | JP                        | 01-222787           | A                              | 09-06-1989                                         | Nippon Synthetic Chem. Ind. Co. | Abstract |
|                          |                       | JP                        | 60-251890           | A                              | 12-12-1985                                         | Nippon Synthetic Chem. Ind. Co. | Abstract |
|                          |                       | JP                        | 63-123387           | A                              | 05-27-1988                                         | Denki Kagaku Kobyo KK           | Abstract |
|                          |                       | JP                        | 2001-294549         | A                              | 10-23-2001                                         | Pfizer Prod. Inc.               | Abstract |

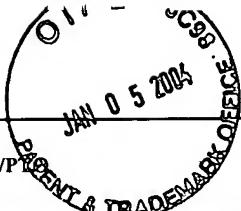
| NON PATENT LITERATURE DOCUMENTS |                       |                                                                                                                                                                                                                                                                                  |  |  |                          |
|---------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--------------------------|
| Examiner Initials*              | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.                 |  |  | Translation <sup>6</sup> |
|                                 |                       | ITOH et al., "Production of chiral alcohols by enantioselective reduction with NADH-dependent phenylacetaldehyde reductase from <i>Corynebacterium</i> stain, ST-10", <i>Journal of Molecular Catalysis B: Enzymatic</i> , Vol. 6, 1999, pp. 41-50                               |  |  |                          |
|                                 |                       | ITOH et al., "Purification and Characterization of Phenylacetaldehyde Reductase from a Styrene-Assimilating <i>Corynebacterium</i> Strain, ST-10", <i>Applied and Environmental Microbiology</i> , Vol. 63, No. 10, October, 1997, pp. 3783-3788                                 |  |  |                          |
|                                 |                       | WANG et al., "Cloning, sequence analysis, and expression in <i>Escherichia coli</i> of the gene encoding phenylacetaldehyde reductase from styrene-assimilating <i>Corynebacterium</i> sp. Strain ST-10", <i>Applied Microbiology Biotechnology</i> , Vol. 52, 1999, pp. 386-392 |  |  |                          |
|                                 |                       | ITOH et al., "1465. Chiral alcohols production by enantioselective reduction with NADH-dependent phenylacetaldehyde reductase (PAR)", <i>Book of Abstracts, 2000 International Chemical Congress of Pacific Basin Societies</i> , December 14-19, 2000, p. 9                     |  |  |                          |
|                                 |                       | ITOH et al., "3Y7p7. Production of optically active alcohol by using a phenylacetaldehyde reductase (PAR) recombinant strain", <i>Nippon Nogeikagaku Kaishi</i> , Vol. 75, March 5, 2001, with translation of 3Y7P7                                                              |  |  |                          |

|                           |  |                        |
|---------------------------|--|------------------------|
| <b>Examiner Signature</b> |  | <b>Date Considered</b> |
|---------------------------|--|------------------------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kind Codes of USPTO Patent Documents at www.uspto.gov, MPEP 901.04 or in the comment box of this document. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to indicate here if English language Translation is attached.

Substitute for Form 1449 A &amp; B/PTO



**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

|       |   |    |   |                        |        |
|-------|---|----|---|------------------------|--------|
| Sheet | 2 | of | 2 | Attorney Docket Number | Q76266 |
|-------|---|----|---|------------------------|--------|

| U.S. PATENT DOCUMENTS |                       |                 |                                      |                                |                                                 |
|-----------------------|-----------------------|-----------------|--------------------------------------|--------------------------------|-------------------------------------------------|
| Examiner Initials*    | Cite No. <sup>1</sup> | Document Number |                                      | Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
|                       |                       | Number          | Kind Code <sup>2</sup><br>(if known) |                                |                                                 |
|                       | US                    |                 |                                      |                                |                                                 |

| FOREIGN PATENT DOCUMENTS |                       |                           |                     |                                |                                                    |                          |
|--------------------------|-----------------------|---------------------------|---------------------|--------------------------------|----------------------------------------------------|--------------------------|
| Examiner Initials*       | Cite No. <sup>1</sup> | Foreign Patent Document   |                     | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Translation <sup>6</sup> |
|                          |                       | Country Code <sup>3</sup> | Number <sup>4</sup> |                                |                                                    |                          |
|                          |                       |                           |                     |                                |                                                    |                          |
|                          |                       |                           |                     |                                |                                                    |                          |
|                          |                       |                           |                     |                                |                                                    |                          |
|                          |                       |                           |                     |                                |                                                    |                          |
|                          |                       |                           |                     |                                |                                                    |                          |
|                          |                       |                           |                     |                                |                                                    |                          |

| NON PATENT LITERATURE DOCUMENTS |                       |                                                                                                                                                                                                                                                                                                 |  |  |                          |
|---------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--------------------------|
| Examiner Initials*              | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.                                |  |  | Translation <sup>6</sup> |
|                                 |                       | ITOH et al., "3F302B. Analysis of the phenylacetaldehyde reductase (PAR) gene from styrene-assimilating <i>Corynebacterium</i> ", <i>Nippon Nogeikagaku Kaishi</i> , Vol. 74, March 5, 2000, with translation of 3F302B                                                                         |  |  |                          |
|                                 |                       | ITOH et al., "3F303a. Production of optically active alcohol by using the phenylacetaldehyde reductase (PAR) from <i>Corynebacterium</i> sp. ST10", <i>Nippon Nogeikagaku Kaishi</i> , Vol. 74, March 5, 2000, with translation of 3F303a                                                       |  |  |                          |
|                                 |                       | ASAKO et al., "P214. Chiral Alcohol Production by $\beta$ -Ketoester Reductase from <i>Penicillium citrinum</i> Coupled with Regeneration System of NADPH", <i>Chem. Litsy</i> 97, 6 <sup>th</sup> International Symposium on Biocatalysis and Biotransformations, June 28-July 3, 2003, p. 489 |  |  |                          |
|                                 |                       | Lecture Summary Series of the 6 <sup>th</sup> Organism Catalyst Chemistry Symposium, December 12-13, 2002, p. 70, with partial English translation                                                                                                                                              |  |  |                          |
|                                 |                       | Conference Lecture Summary Series, published March 5, 2003, 3A11a01, with partial English translation                                                                                                                                                                                           |  |  |                          |

|                    |  |                 |  |
|--------------------|--|-----------------|--|
| Examiner Signature |  | Date Considered |  |
|--------------------|--|-----------------|--|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kind Codes of USPTO Patent Documents at www.uspto.gov, MPEP 901.04 or in the comment box of this document. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to indicate here if English language Translation is attached.